

## DemcoTECH Engineering: state-of-the-art technologies and design tools for stacking and reclaiming

At the heart of stockpiling and storage of bulk materials handling are the stacking and reclaiming processes, activities that are performed by equipment, which, whether working as a system or individually, operates all year round and is exposed to temperature extremes, moisture, abrasive material, dust and other contaminants, in addition to having to withstand severe operational loads. This equipment requires state-of-the-art design to ensure that it not only operates at the desired performance levels but is also sufficiently robust to provide a long service life, according to materials handling and niche process plant specialist, DemcoTECH Engineering.

“As a result, DemcoTECH’s strength in powerful simulation techniques and FEA analysis was critical to its appointment as engineering contractor on Vale’s multimillion-dollar Teluk Rubiah maritime terminal project in Malaysia,” adds DemcoTECH Engineering General Manager, Paul van de Vyver. “For example, amongst other simulations and analyses on the overall project, we performed FEA on the stacking, reclaiming and ship-offloading machines purchased from a China-based supplier for the project.”

DemcoTECH was involved from feasibility through to commissioning for the project, establishing the distribution centre, which includes an iron ore stockyard with blending facilities, an import and export terminal, as well as sampling facilities. Appointed to engineer the materials handling system, DemcoTECH provided the conceptual design of the 60mt (million tonnes) a year terminal and the materials handling layouts, as well as the design and basic engineering for the entire materials handling system, specifying all the mechanical equipment, adjudicating all the technical portions of the tenders and auditing and ensuring the final designs were suitable for the project.

In a more recent project for the regional ports and terminals sector, DemcoTECH’s



*Materials handling for sulphur project in Malaysia.*



expertise in stacking and reclaiming was rewarded with a turnkey contract for a prestigious sulphur handling project in Malaysia

The materials handling contract included the materials handling system from the delivery and stockpiling of the sulphur, through to reclaiming and loading the sulphur onto ships for export purposes. The contract included design, engineering, supply, construction and commissioning of the entire system. The

major equipment included the rail mounted stacker and portal scraper reclaimers, all the conveyor systems, including a multi-curved 2.2km-long pipe conveyor, and the quayside belt conveyor, which in turn feeds onto the rail mounted ship loader. The equipment was fully integrated with the jetty design.

As DemcoTECH follows a global procurement strategy in order to optimize cost-effectiveness without compromising on quality, components and portions of equipment were sourced from five different countries, while the erection of the plant in



*Letšeng Diamond Mine stacking conveyor with a new angled raking trestle.*

Malaysia maximized the use of local labour as a requirement of the client.

“Environmental considerations were also a priority of the project with the stockpile being contained and isolated to prevent contamination of the surrounding area. In addition, our pipe conveyor was selected as an environmentally friendly method of conveying material due to the fact that it is a fully enclosed method of conveying material on a completely open jetty, fully exposed to the elements. The elimination of transfer points also reduced the potential for spillages and dust generation as did the inclusion of a state-of-the-art telescopic chute on the shiploader;” notes van de Vyver.

In Lesotho, DemcoTECH has been involved from 2008 at Lētseng Diamond Mine, initially to supply the tailings disposal system as part of the establishment of a second diamond treatment plant at the mine (Plant No 2). In more recent work DemcoTECH completed the conveyor design and expansion layout to increase the tailings dam size in order to be able to handle an expanded throughput, and in a later contract focused on upgrading part of

*Lētseng: the drive of the 24m-high boom of the ROM stacker was relocated down to ground level for ease of maintenance.*



the mine tailings materials handling capability.

The above included upgrading the run-of-mine (ROM) stacking conveyor to enable the tailings system to handle the higher capacities resulting from Lētseng's Project Kholo, which, amongst other objectives, aimed at increasing ore throughput. Improvements included installing a new rake trestle as well as relocating the 160Kw drive from the head end of the 33m-high boom and relocating it at ground level near the tail end for ease of maintenance. This entailed an entire review and redesign of the conveyor structure.

“The fact that Lētseng is the highest diamond mine in the world, located at an

altitude of approximately 3,200m and with ambient temperature ranging from about  $-18^{\circ}\text{C}$  to  $30^{\circ}\text{C}$ , presented numerous challenges during the design of the equipment in order to withstand these conditions, as well as during construction and commissioning in this hostile environment,” adds van de Vyver.

DemcoTECH also completed a materials handling system for the disposal of dry tailings at Lihobong Diamond Mine in Lesotho in under a year. The system included a 15m mobile slewable stacker, which is self-propelled, being driven on all four wheels.

“Our expertise in stacking and reclaiming has enabled DemcoTECH to establish a solid footprint, both in Southern Africa, further north in Africa and offshore,” notes van de Vyver. “Our extensive track record in developing stockyard facilities now covers Africa, the Far East and Eastern Europe.

“In addition to the state-of-the-art technologies, much of our success has been due to our ability to cover the complete scope of project services from concept development, feasibility studies and audits through to project execution.”



*Rendering of Teluk Rubiah maritime terminal project in Malaysia.*